

NASA Earth Science Enterprise Technology Planning Workshop



Workshop Overview and Purpose

Fuk Li

New Millennium Program

Jet Propulsion Laboratory, California Institute of Technology

January 23-24, 2001

Hyatt Arlington Hotel - Arlington, VA

Preliminary Agenda

Tuesday January 23, 2001



Granville Paules

Fuk Li

Diane Wickland

Phil DeCola

Bob Schiffer

Chet Koblinsky

John Labrecque

Stephen Wharton

Fuk Li/George Komar

8:00 Introduction/Welcome

8:15 Workshop Overview and Purpose

8:30 Earth Science/Application Themes and Capability Needs

- Biology and Biogeochemistry of Ecosystems and the Global Carbon Cycle
- Atmospheric Chemistry, Aerosols, and Solar Radiation
- Global Water and Energy Cycle
- Oceans, and Ice in the Earth System
- Solid Earth Science
- Data Systems

10:15 Overview of Key Technology Areas

10:45 Break - (Reconfigure Plenary Room for Breakout Sessions)

11:00 Breakout Sessions

- Lightweight Deployable Antennas
- Deployable Telescopes
- Precision Navigation
- Integrated Optics and Spectral Dispersion Technologies
- High Rate Communications
- Distributed Spacecraft Infrastructure
- Onboard Data Processing
- Laser Technology
- Innovative Technologies

12:15 Lunch

1:00 Breakout Sessions

- Identify science capability needs
- Review technologies in the pipeline

5:00 Adjourn

Preliminary Agenda

Wednesday January 24, 2001



- 8:30 Plenary: Mid-Term Breakout Session Summary Fuk Li/George Komar
- 9:00 Break - (Reconfigure Plenary Room for Breakout Sessions)
- 9:15 Breakout Sessions (continued)
- Identify convergence of Science needs and candidate Technology approaches
 - Formulate technology development roadmaps, with major development milestones
 - identify technology development gaps
- 12:00 Lunch
- 1:00 Breakout Session
- Define technology development plans
 - Justify flight validation where necessary
 - Ground Validation requirements and approach
- 3:00 Break - (Reconfigure Plenary Room)
- 3:15 Summary Plenary Session Fuk Li/George Komar
- 5:00 Adjourn

Purpose



Identify technology development and space flight validation requirements for future Earth Science Missions

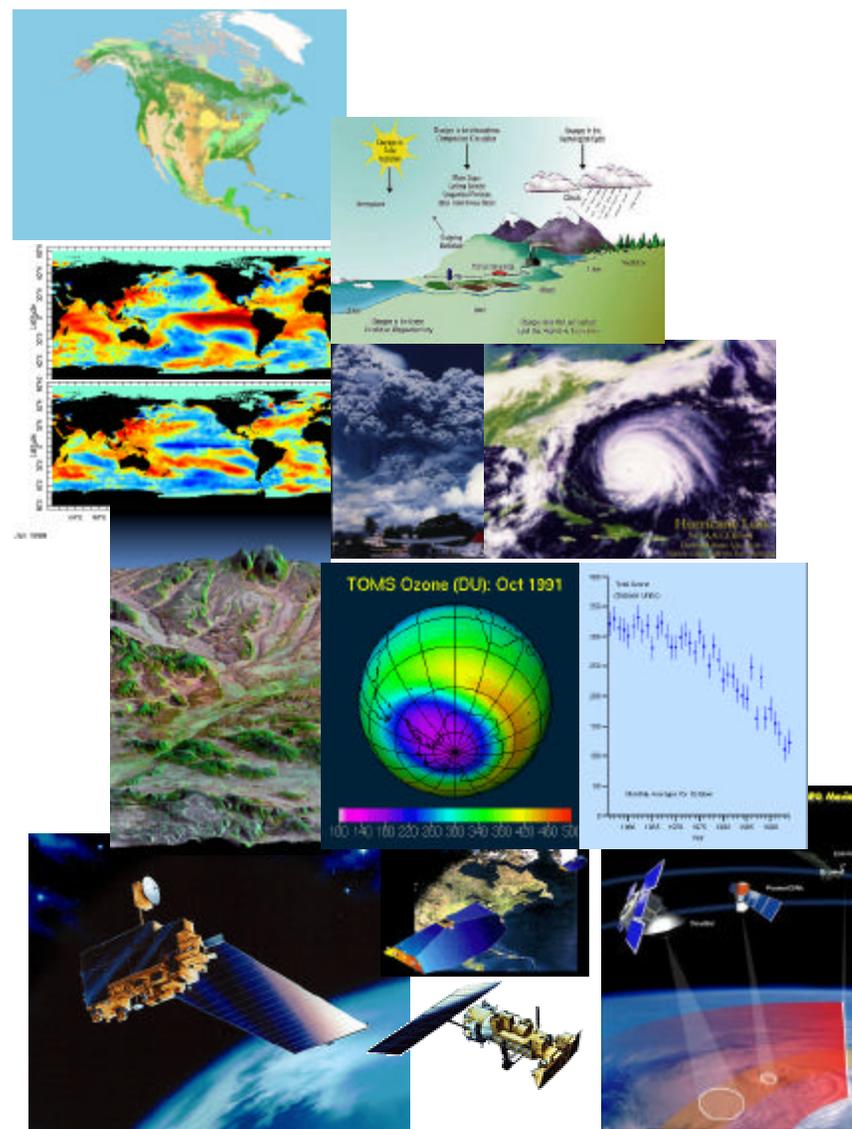
- Focus on high-value technologies that are likely to require a validation in space

- Define a set of high-payoff candidate technologies
 - have a priority and readiness to support a validation flight in mid-late decade
 - needed to enable science missions launched in 5 to 15 years

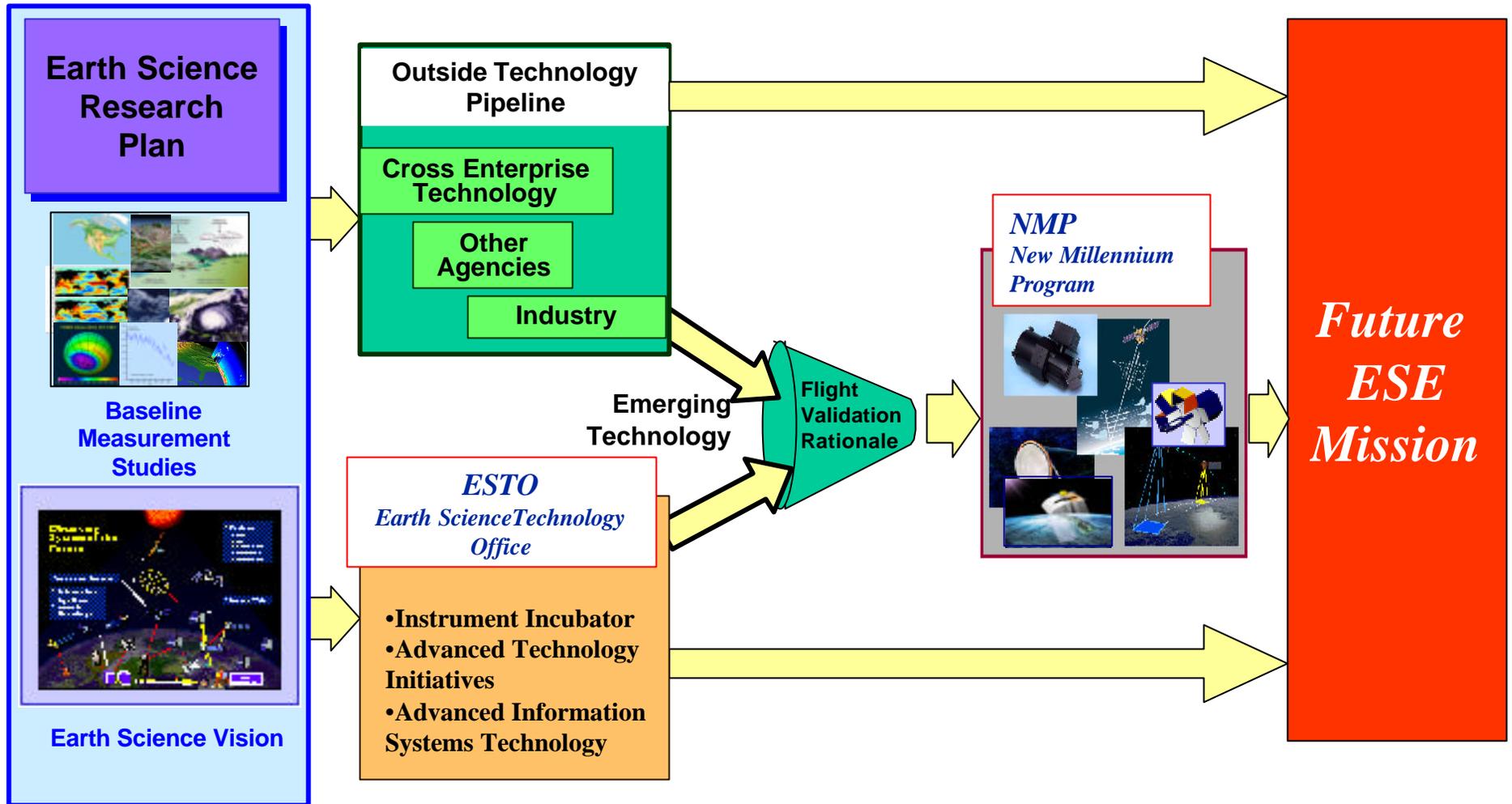


ESE Science Themes

- Biology and Biogeochemistry of Ecosystems and the Global Carbon Cycle
- Atmospheric Chemistry, Aerosols, and Solar Radiation
- Global Water and Energy Cycle
- Oceans and Ice in the Earth System
- Solid Earth Science
- Data Systems



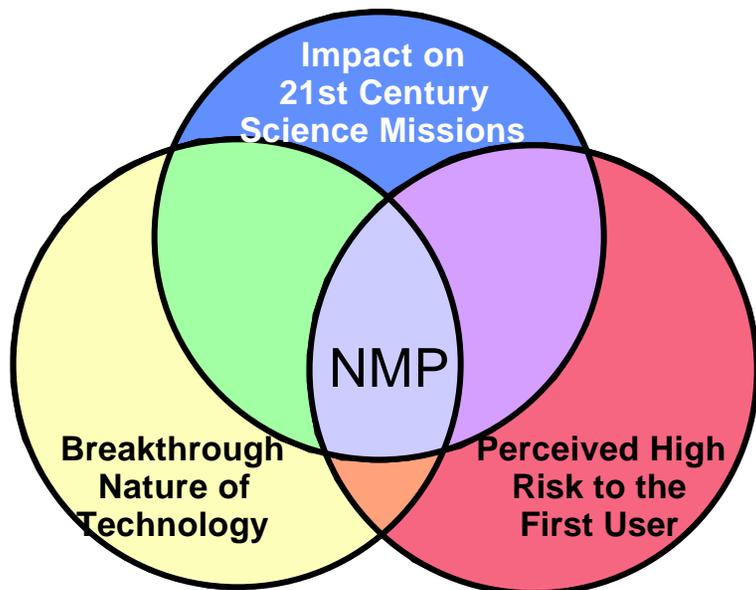
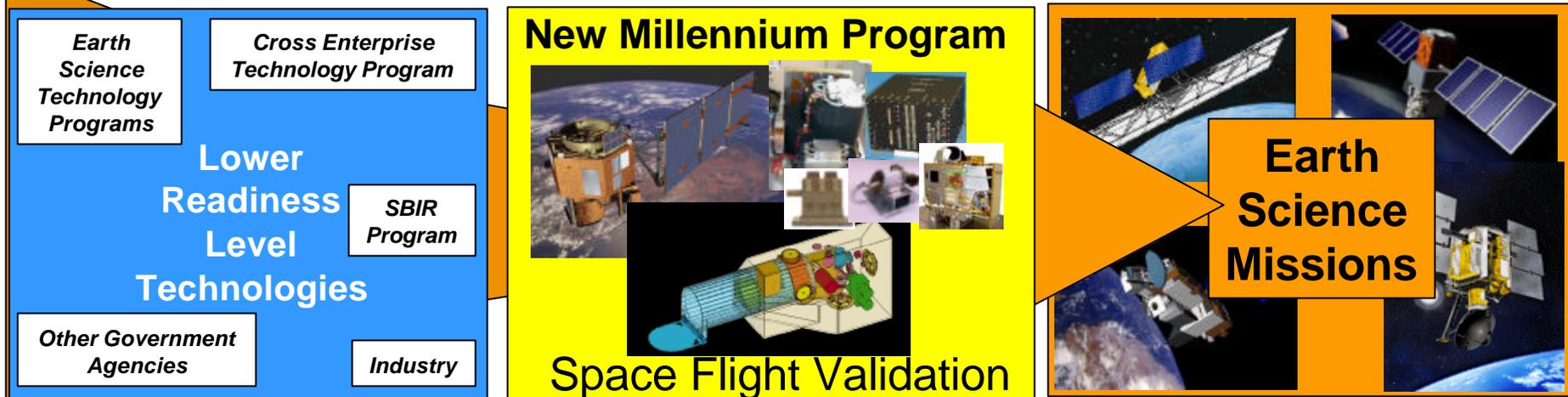
ESE Technology Development Process



Breakthrough Technologies Requiring Space Flight Validation



New Millennium Program Role



Breakthrough technologies

- Enable new capabilities to meet Earth Science needs
- Reduce costs of future missions

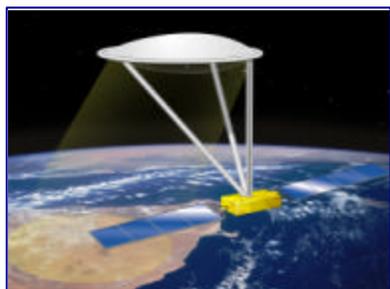
Flight validation

- Mitigates risks to first users
- Enables rapid technology infusion into future missions

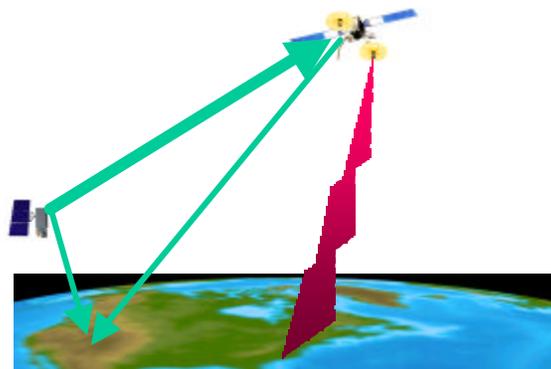
Workshop Organized Around Breakout Sessions



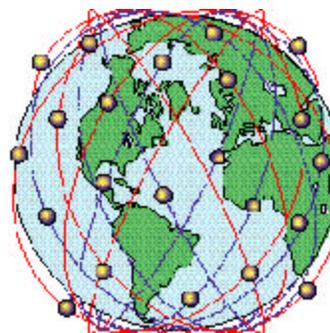
- Recurring technology validation “themes”
- Technology themes benefit a broad set of Earth Science measurements



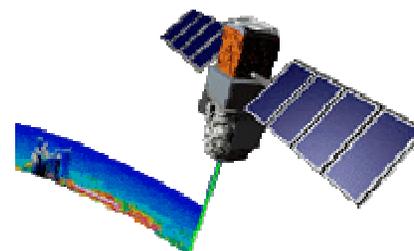
Lightweight Deployable Antennas



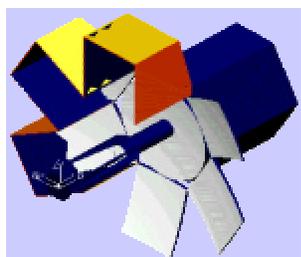
Ultra-High Data Rate Communications



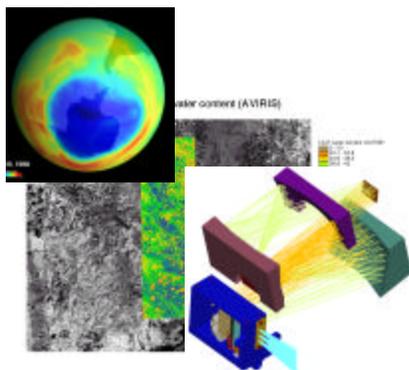
Precision Navigation



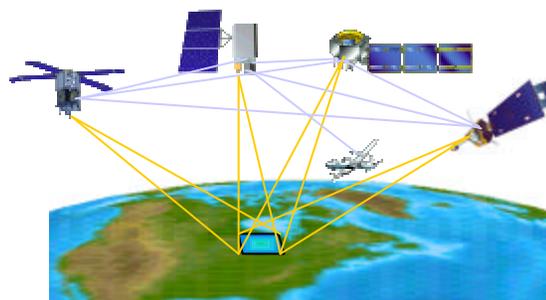
Laser/Lidar Technologies



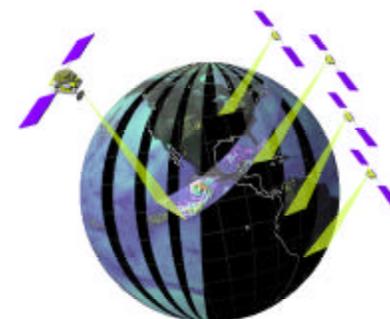
Deployable UV/Vis/IR Telescopes



Integrated Optics and Spectral Dispersion Technologies



Distributed Spacecraft Infrastructure



Onboard Data Processing



Breakout Session Objectives

- Clarify the relevance of each class of technologies for future ESE science mission objectives
 - new science investigations enabled by technologies
 - new measurement type, new vantage points (MEO, GEO, L1, L2)
 - requirements for spatial, temporal, or spectral resolution or sampling
 - needed by multiple measurement approaches?
 - anticipated time scale for science mission
- Define technology development/flight validation needs
 - capabilities that require new technology development
- Identify requirements for flight validation
 - justification
 - objectives, scope, and milestones
 - top-level validation flight development scenario